Dynamic Button Edge Lit & Non Edge Lit Component Breakdown & Preventative Maintenance Guide

Casino Services Technical Product Support

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This document focuses on the component breakdown of Edge Lit and Non Edge Lit Dynamic Buttons. How to breakdown clean and maintain (PM) both types of dynamic buttons, along with a comprehensive parts list.

Dynamic Button Non Edge Lit Assembly Parts Breakdown:

➢ The first Dynamic Button used by IGT was provided by LC&D. Currently IGT is using Keytronic for its Non Edge Lit Dynamic Buttons. At first glance both the old style (LC&D) and newer style (Keytronic) Dynamic Buttons look identical. However, look closely at the bottom of the bezels threaded end. The older LC&D button has two access holes while the newer Keytronic only has one. See Figures A and B.
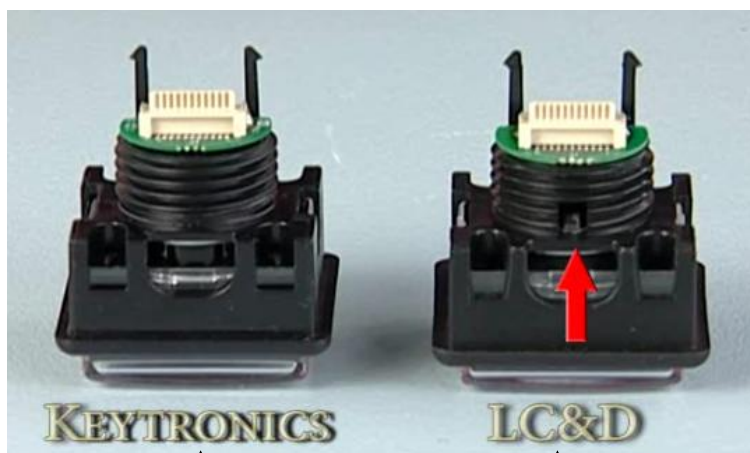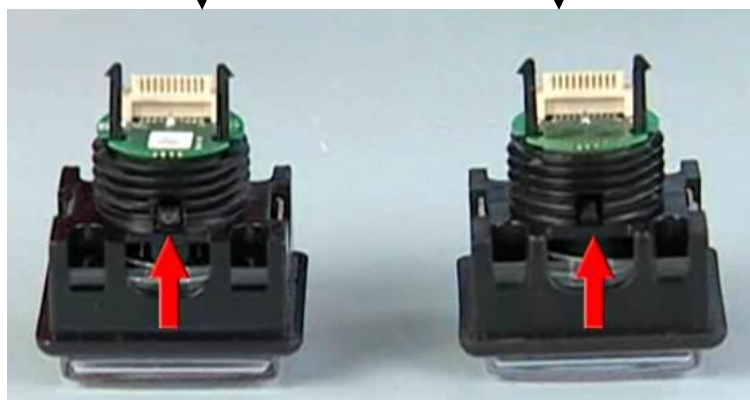

Figure A

Figure B

➢ There are two significant differences that you will need to be concerned with when ordering any replacement parts, or before servicing an LC&D vs. Keytronic Dynamic Button assembly. The **Bezel** and **Lens Holder** are different between the LC&D vs. Keytronic Dynamic Button assembly. All other parts listed under the BOM cross over and can be used with either manufacturer. See Figure C.


Figure C

➢ When ordering a complete Non Edge Lit Dynamic Button assembly you will continue to use P/N 51801000. However, if preferred you may now order the individual constituent components of the Dynamic Button assembly.

**Non Edge Lit Dynamic Button Assembly (51801000) Parts Breakdown:**
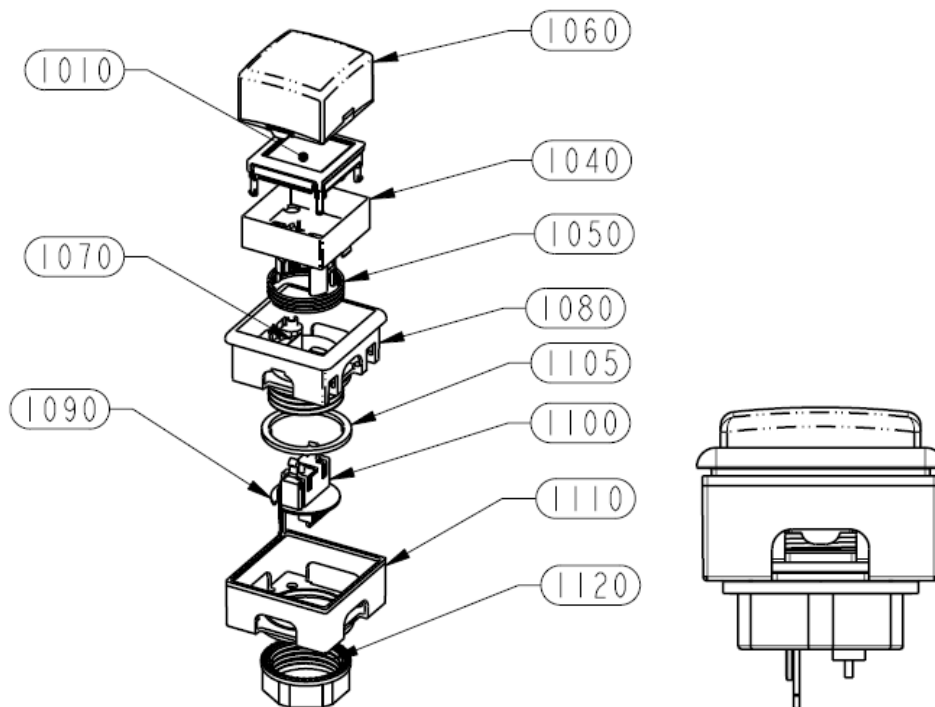
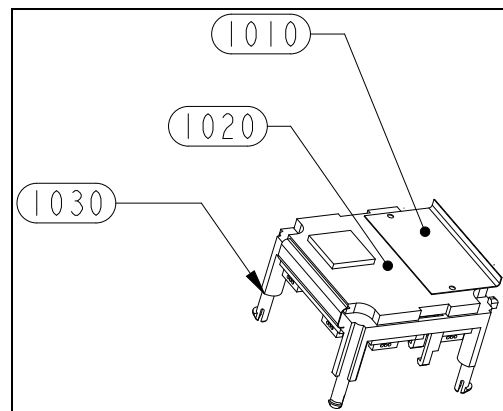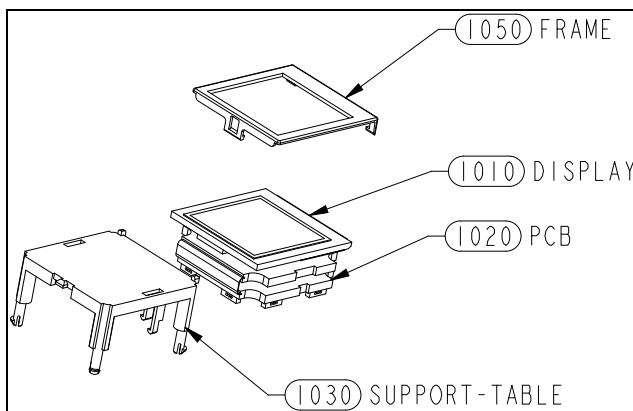| Item Number	Part Number	Description
1002	82476001	SPEC,SW,1.5 X 1.5 IN,16 SHADE,96X96 OLED
1010	25330400W	DISPLAY OLED ASM-YEL,96X96,27X27 MM
1040	65925100	LENS HOLDER-96X96 DYNMC BTN, LC&D
	65925101	LENS HOLDER-96X96 DYNMC BTN, KTE
1050	33120100	SPRING,COIL-DYNAMIC BTN SWITCH
1060	65925000	LENS-CLEAR, 96X96 DYNMC BTN, LC&D
1070	75400900W	PCB, FLT, 22 LINE, INTERCONNECT, ASY
1080	65240800	BEZEL, DYNAMIC BTTN, LC&D
	65240801	BEZEL, DYNAMIC BTTN, KTE
1090	75400400W	PCB, 21 PIN CONAN TO 22 PIN FLT, ASY
1100	80906400	LOCK, PCB& SWITCH,FLEX-CLIPS, DYNMC BTTN
1105	66312600	GASKET-RING, SEAL, DYNAMIC BUTTON
1110	66119700	SPACER-SWITCH, DYNAMIC, LCD, 1.05IN, SQUARE
1120	42906800	NUT, HEX 1.125 DIA X 0.432 H, DYNMC BTN
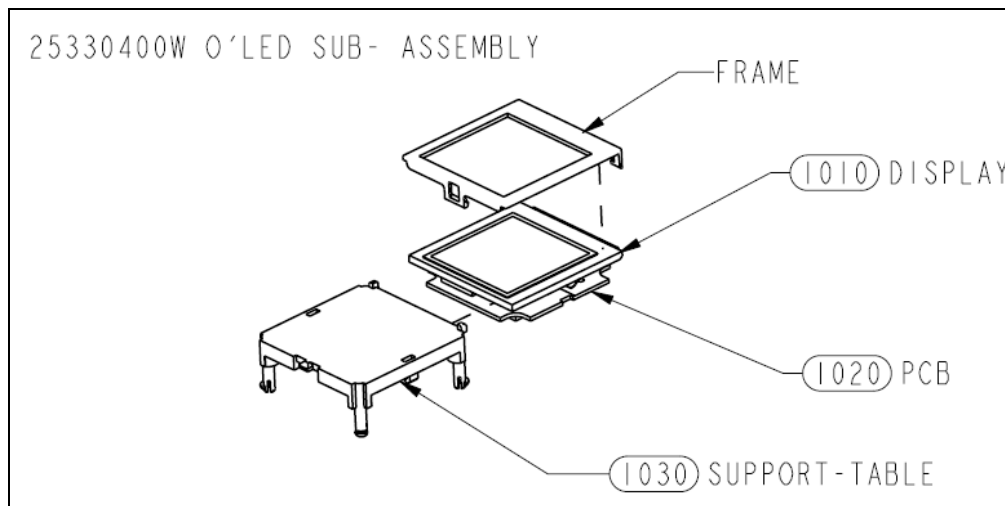
25330400W - DISPLAY OLED ASM-YEL, 96X96, 27X27MM

Item Number	Part Number	Description
1010	25309600W	DISPLAY, OLED, YEL, 96X96, 27X27 MM PNL
1020	76941500W	PCB, MONO, 96X96, OLED, CONTR LVDS, ASY
1030	67638600	SUPPORT-OLED TABLE DYN BTN
1050	64730100	FRAME-96X96 OLED, DYN BTN

## Edge Lit Dynamic Button Assembly (51841903) Parts Breakdown:
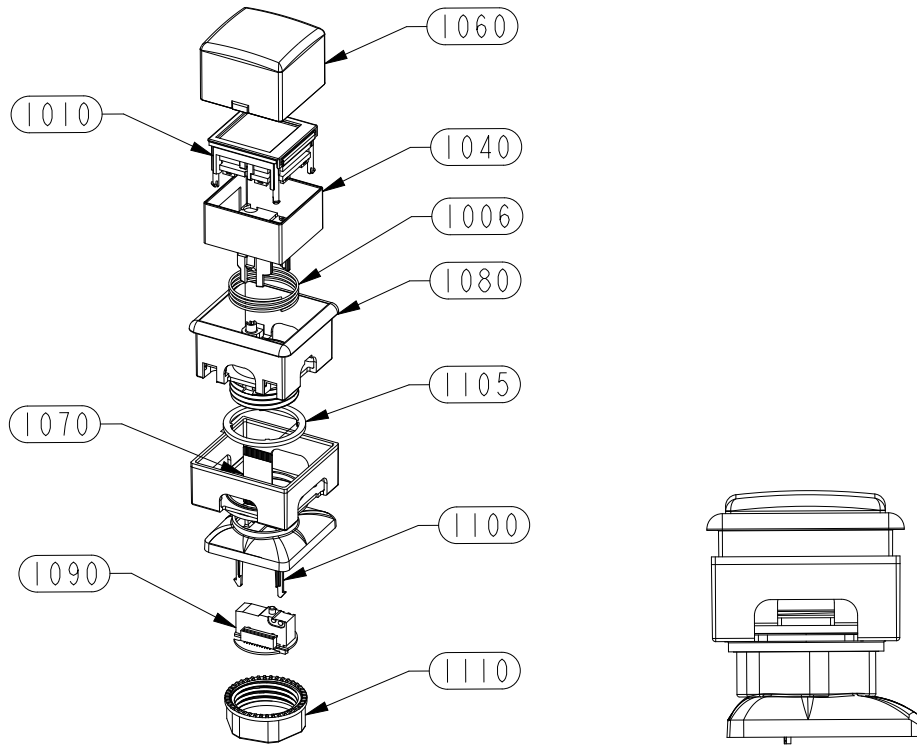
| Item Number	Part Number	Description
1006	33120100	SPRING, COIL-DYNAMIC BTN SWITCH
1010	25330501W	DSPLY OLED SUB,YEL,RGB,CNT RNG2,27X27MM
1040	65926701	LENS HLDR/ACTUATR-LIT BZL, 96X96 DYN BTN
1060	65925900	LENS-CLEAR, LIT BZL, 96X96 DYN BTN
1070	75400901W	PCB, FLT, 22 LINE, INTRCON, EDGE LIT DB, ASY
1080	65244701	BEZEL-RGB LIT, 96X96 DYN BTN
1090	75400401W	PCB, 21P CONAN TO 22P FLT, 150G SW, ASY
1100	80906400	LOCK, PCB& SWITCH, FLEX-CLIPS, DYNMC BTTN
1105	66312600	GASKET-RING, SEAL, DYNAMIC BUTTON
1110	42906800	NUT, HEX 26MM X 0.413MM , DYNMC BTN

**25330501W - DISPLAY OLED SUB, YEL, RGB, 96X96, 27X27MM**

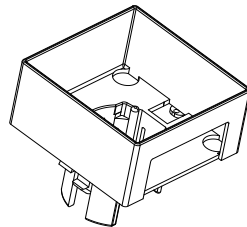| Item Number	Part Number	Description
1010	25309600W	DISPLAY, OLED, YEL, 96X96, 27X27 MM PNL
1020	76941501W	PCB, MONO, 96X96, OLED, RING, CONTR LVDS, ASY
1030	67638700	SUPPORT-OLED/RGB HLDR, 96X96 DYN BTN
1050	64730100	FRAME-96X96 OLED, DYN BTN
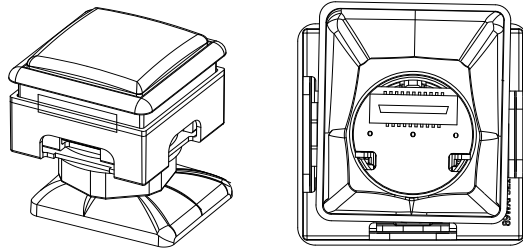
51841903 - SWITCH-ASSY, EDGE LIT CONT RING 2, DYN BTN
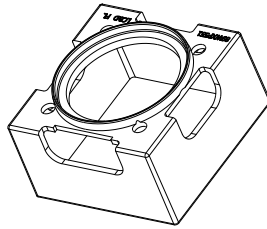
GATE TAB
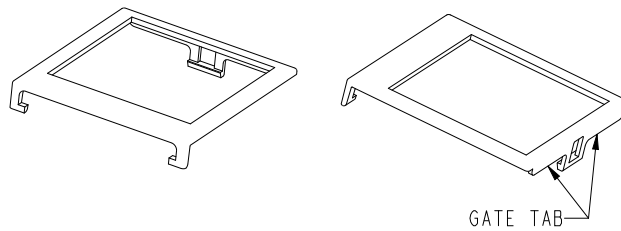
64730100 - FRAME-96X96 OLED, DYN BTN
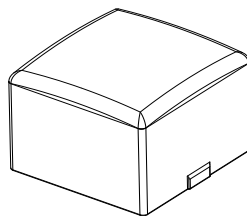
65925900 - LENS-CLEAR, LIT BZL, 96X96 DYN BTN

65926701 - LENS HLDR/ACTUATR-LIT BZL, 96X96 DYN BTN

66119800 - SPACER-WHT, LIT BZL, .89T, DYN BTN
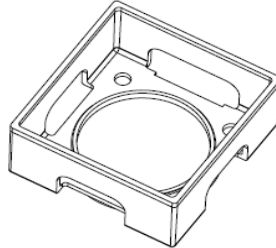
66119900 – SPACER-WHT, LIT BZL, .742 96X96 DYN BTN (G23, G23v2, GL20 & BC20)

Need one with the other

66101700 – RISER-DISCO BP, SINGLE BTN (Riser Not Shown) riser to be only used with ELDB on G23, G23v2, GL20 & BC20

67638700 - SUPPORT-OLED/RGB HLDR, 96X96 DYN BTN

68750100 - COVER-RIGIDIZER, 10/9, DYNAMIC BTN FLEX

Component Identification:
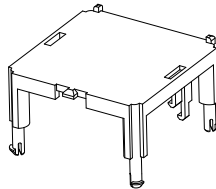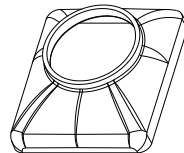
➢ Currently there are two types of Dynamic Buttons sold by IGT "Non Edge Lit" and "Edge Lit". The key differences between these two types of Dynamic Button assemblies are:

   o **Lens or Lens Cap:**

   • Below shows a standard lens cap for both types of Dynamic Buttons. See Figure D

   • The Lens Caps in Figure D show the Edge Lit Dynamic Button as being taller than the Non Edge Lit Dynamic Button.
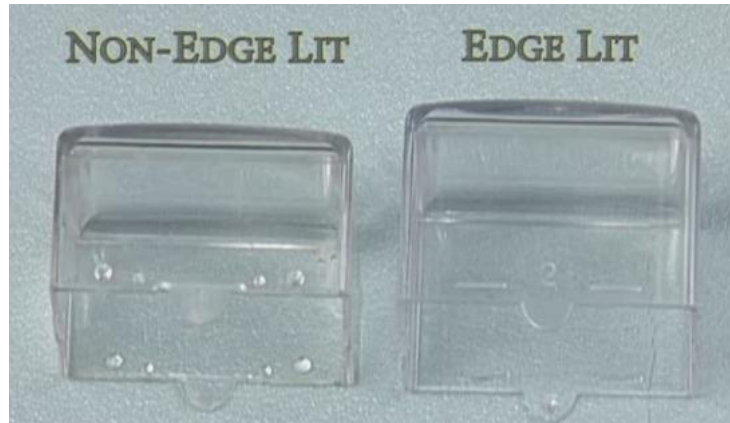

Figure D

   o **Lens Holder:**

   • The Lens Holder in Figure E shows the differences in the overall look between the Edge Lit and Non Edge Lit Dynamic Buttons.
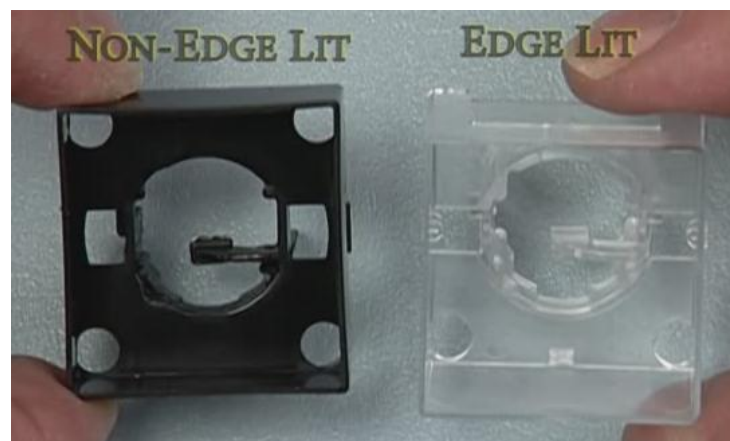

Figure E

- **Non Edge Lit OLED Display:**

  - 25330400W DISPLAY OLED ASM-YEL, 96X96, 27X27MM. This is the complete sub-assembly as shown on page 4.

  - 25309600W Display, OLED, YEL, 96X96, 27X27MM, PNL. This is the OLED display used in the Non Edge Lit Dynamic Button assembly. See Figure F.

  - 76941500W PCB, MONO, 96X96, OLED CONTROLLER, LVDS, ASSY. See Figure F.

    1. This board decodes a 4 bit address so it will know what position it is in on a FLEX harness and decode differential signaling communications to display graphics on an OLED display for an OLED Dynamic Button module (51801000).

    2. The 76941500W PCB Controller gets access to the serial communications, power, address and programming through a set of boards, 75400900W and 75400400W, in an OLED button assembly (51801000W). See Figure F.

Figure F.

- 75400900W PCB, FLT, 22 LINE, INTERCONNECT. See Figure G.

Figure G

- The 75400900W PCB board provides an interface from a 22 pin female connector that is on the 75400400W PCB (P2) to another 22 pin female connector on the 76941500W PCB (P3). See Figures H.
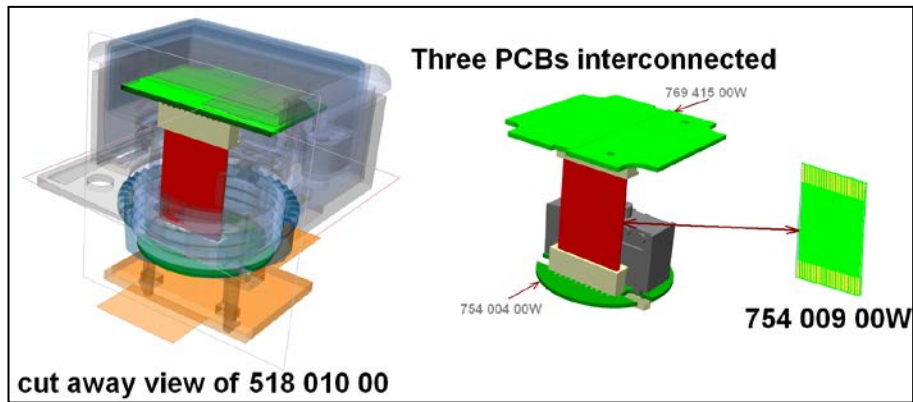
Figure H

- 75400400W PCB, 21 PIN CONAN to 22 PIN FLT.

    1. This board provides an interface from a 21 pin female connector that is on a FLEX harness. See Figures I and J.

    2. Has the switch that detects button depression.

    3. Provides the signal connection for data to the OLED Controller.
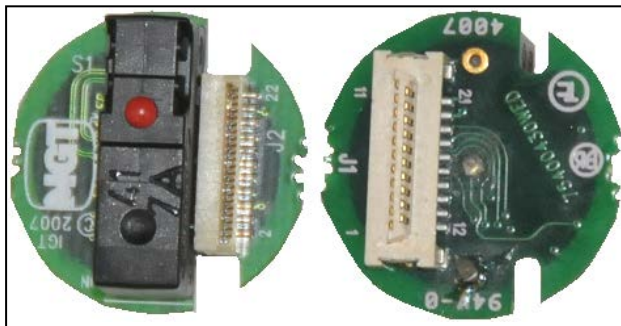
Figure I
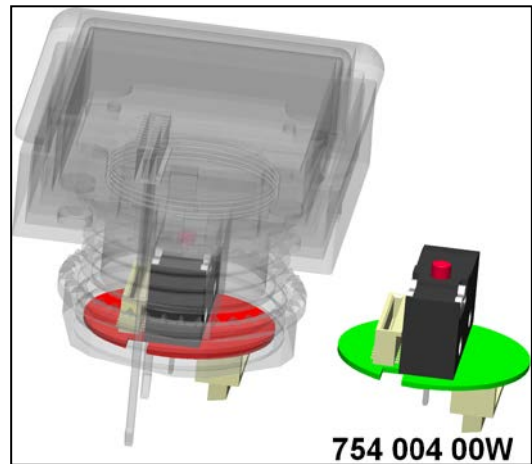
Figure J

o **Edge Lit OLED Display:**

- 25330500W DISPLAY OLED SUB, YEL, RGB, 96X96, 27X27MM. This is the complete sub-assembly as shown on page 5.

- 25309600W Display, OLED, YEL, 96X96, 27X27MM, PNL. This is the OLED display used in both the Edge Lit and Non Edge Lit Dynamic Button assembly. See Figure K.

- 76941501W PCB, MONO, 96X96, OLED CONTROLLER, LVDS, ASSY. See Figure K.

    1. This board decodes a 4 bit address so it will know what position it is in on a FLEX harness and decode differential signaling communications to display graphics on an OLED display for an OLED Dynamic Button module (51841900).

    2. This PCB Controller also contains a secondary PCB (attached by a FLEX) that contains RGB LEDs and a controller.

    3. The 76941501W PCB Controller gets access to the serial communications, power, address and programming through a set of boards, 75400901W and 75400400W, in an OLED button assembly (51841900W). See Figure K.
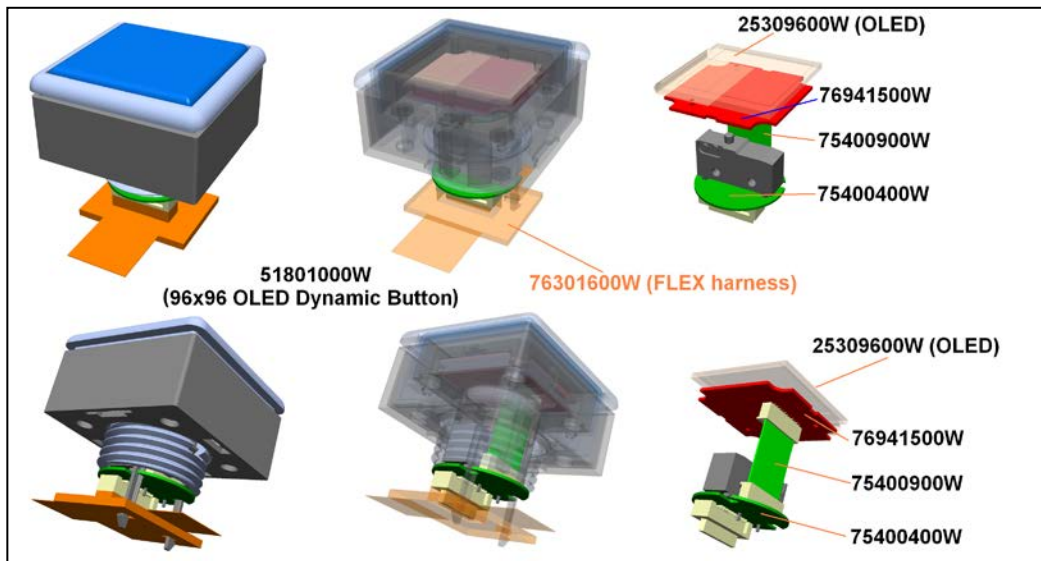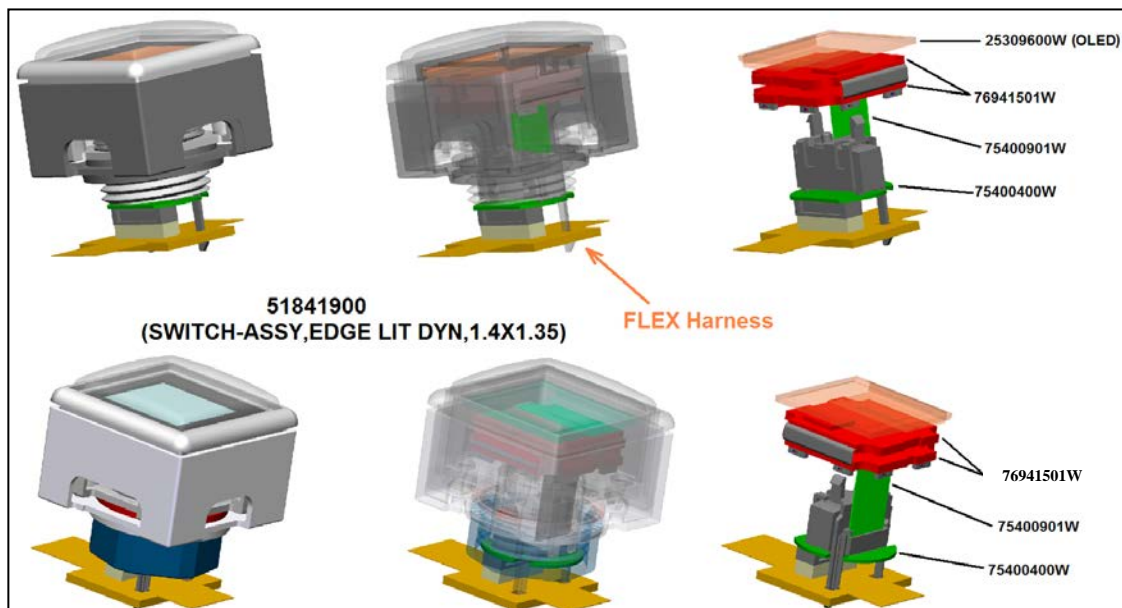

Figure K

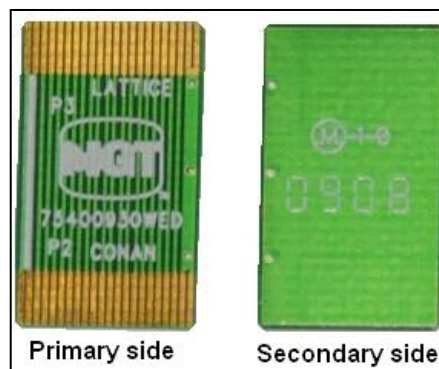- 75400901W PCB, FLT, 22 LINE, INTERCON, EDGE LIT DB, ASY. See Figure L
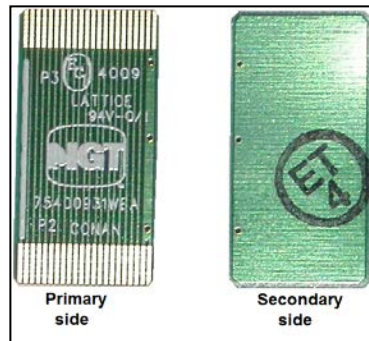
Figure L

- The 75400901W PCB board provides an interface from a 22 pin female connector that is on the 75400400W PCB (P2) to another 22 pin female connector on the 76941501W PCB (P3). See Figure M.
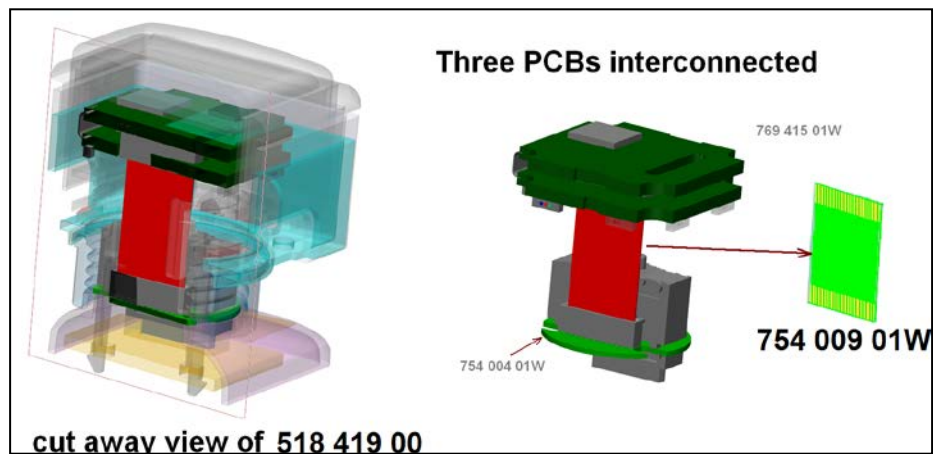
Figure M

- Edge Lit Dynamic Buttons uses the same 75400400W CONAN board as Non Edge Lit. See Page 10.

o **Bezel:**

- The illustrations below show the key differences in size and overall look between the Edge Lit and Non Edge Lit Dynamic Buttons.

| Non Edge Lit | Edge Lit | Non Edge Lit | Edge Lit |
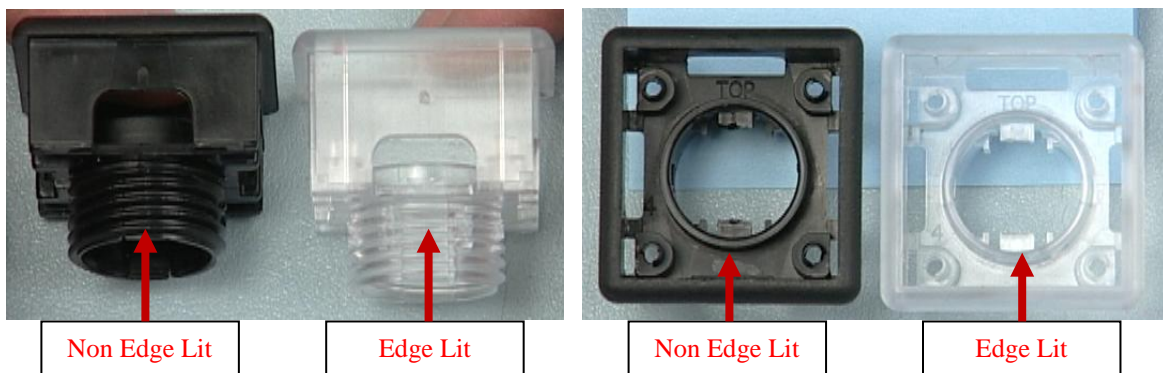
o **Spacer:**

- The Spacers in Figure N below shows the key differences in size and overall look between the Edge Lit and Non Edge Lit Dynamic Buttons. Not shown below is a third spacer used with the G23 V2. The height for the G23 V2 spacer is also different than the two displayed in Figure N.

Figure N

o **Support Table:**

- The Support Tables in Figure O below shows the legs being longer on the Edge Lit Support Table to house the additional controller for RGB. Because of how it is stacked the OLED support table for the Edge Lit appear thicker then the Non-Edge Lit. Because of this the overall size of the bezel and lens cap appears larger for the Edge Lit which can be seen in the illustrations in the above pages.

Figure O

Preventative Maintenance:

➢ Now that we have identified the parts that make up the Edge Lit and Non Edge Lit Dynamic Buttons, let's go through the Preventive Maintenance (P.M.) process.

➢ If a liquid other than water is spilled onto the button assembly and is not addressed immediately, the moisture may prevent the buttons from working properly. Any residue left over from the spill may form between the lens and the body of the button causing it to stick. In some cases it might even seep down into the panel.
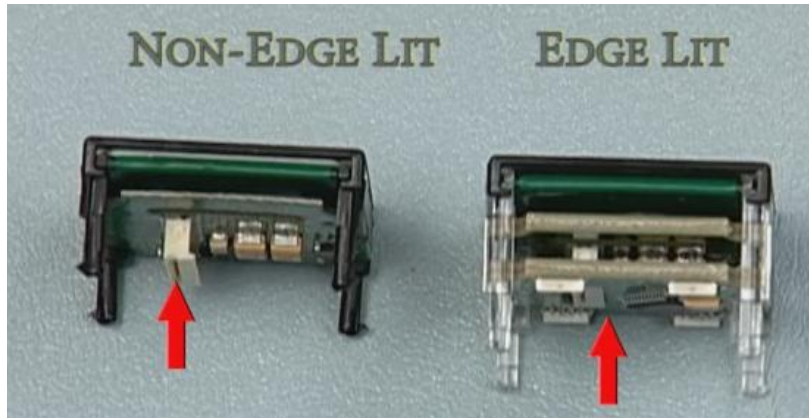
➢ A quarterly maintenance of each player panel switch is recommended. However, extenuating circumstances such as a drink spill or heavily played games may require more frequent PMs.

➢ IGT recommends using an electronic safe cleaning solution. Ensure that the cleaning solution does not contain Alcohol, Ammonia, Silicones or any derivatives of Ammonia. Do not use cleaners or solvents that contain chemicals capable of dissolving or fogging plastic, such as Acetone.

➢ IGT recommended cleaning solution:

- Any cleaning solution that does not contain Alcohol, Ammonia, Silicones or any derivatives of Ammonia.

- Soda Water can be used to break down sugars from drinks or a mild soap and water solution.

- DATAVAC Electric Duster, canned or compressed air. If using compressed air do not use more than 60psi.

- A soft dry cloth.

- An ESD technical cleaning brush with a durable soft bristle.

➢ The DATAVAC electric duster can be used as a more cost effective alternative to the current method of canned air. The IGT part number is 93115015.

➢ The ESD technical cleaning brush is the same that is currently used by depot and what might be identified as an acid brush. The distributor used by depot to purchase the technical cleaning brush is MG Chemicals and their website is www.mgchemicals.com. The specifications needed to purchase the technical cleaning brush are:

1. Catalog number – 855
2. Bristle material – Horse Hair
3. Trim length – ¾"
4. Handle material – Tin
5. Handle length 6"
6. Brush face (LxW) – 1/4" x 3/4"

General Inspection:

➢ A general inspection of and around the switch assembly should be performed to try and ascertain the problem.

    1. Inspect the lens cap area of the switch for aesthetic quality and proper seating in the switch body.

    2. No Sticky Buttons. Confirm that the plunger moves freely, without binding, by repeatedly pressing down on the lens cap, both in the center and around the edges.

    3. Check for moisture within the lens cap, this could also appear as a foggy lens cap.

➢ If the inspection process determines that any part of the switch assembly or any part within the service BOM needs to be addressed. Continue on with the P.M. cycle following the directions outlined in this section. Be sure to follow the directions tailored for the upright and slant cabinets.

Dynamic Button Cleaning / P.M.s

➢ Upright Games:

    o Never force cleaning fluids directly into a dynamic button while it is still installed into an IGT upright gaming machine!

    o There are no trays or flex covers on the upright cabinets to keep heavy amounts of liquids from seeping down into internal components. The ring gasket on the threaded barrel should however keep small amounts of liquids from reaching internal components.

➢ **Upright P.M. Procedures:**

    1. Perform general inspection of the switch assembly. You are looking for any evidence that a drink spill might have occurred. Check for any sticky or worn out buttons.

    2. Power down the game before starting.

    3. If buttons are sticky, very small amounts of cleaning fluids can be forced into the button.

    4. Spray a small amount liquid cleaner over and between the lens cap and bezel of the sticky button.

    5. Use canned air to assist in forcing the cleaner between the lens holder and bezel while working the button.

    6. Use a soft dry cloth to wipe away any extra liquids from the button assembly. **Be sure and check underneath the button assembly for any excessive liquids.** If any liquids are present wipe it away before allowing it to reach any of the internal components.

    7. Next, check to see if button is no longer sticking.

8. On upright games this process should never be repeated. If the button continues to stick proceed to the next step.

9. If after cleaning the button continues to stick it will need to be removed from the player panel, disassembled, cleaned and reassembled. See the **"External Button Cleaning Procedures"** section of this document starting on page 20.

➢ **Cleaning Procedure for Edge Lit Dynamic Buttons on a Universal Slant:**

Universal Slant product incorporates a plastic enclosure under the button panel to manage flow from liquid spills.
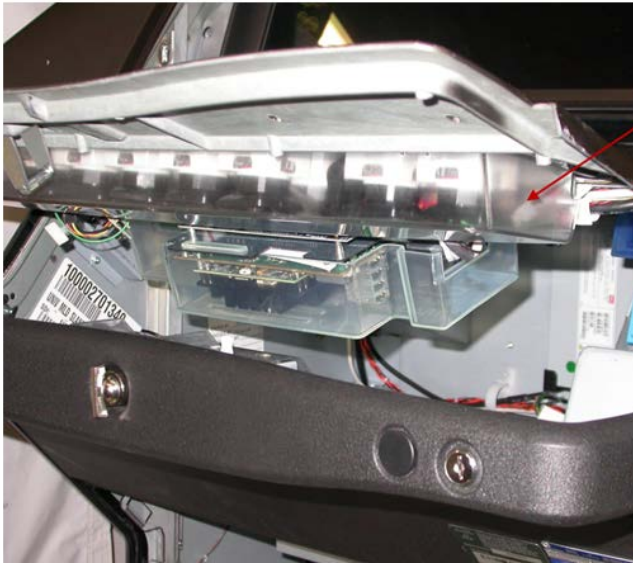
This spill tray is designed to channel liquids to the far left and right side drain holes, keeping liquids away from electrical components within the machine.

View of the button under the switch panel shows protective covers around button connections that shield liquid from these critical connections as long as the button is kept in the upright position during a spill condition.
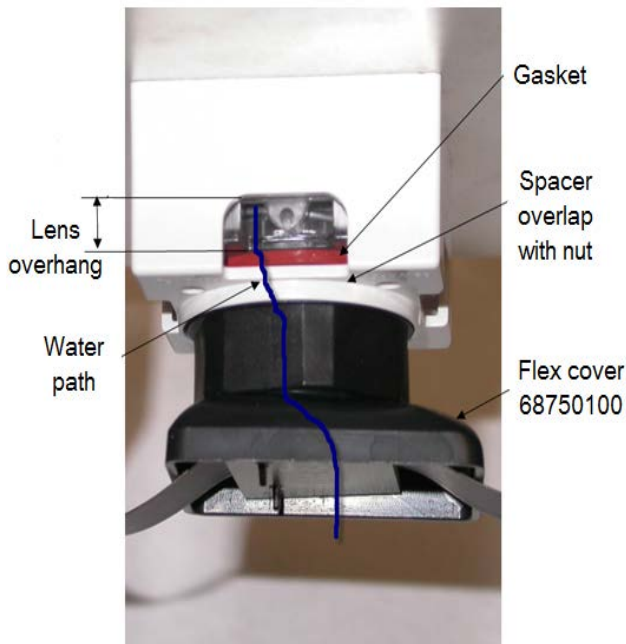
Gaskets keep liquids from internal components.

Lens hangs past PCB housing protecting components from liquids.

Button design moves all liquids away from internal PCBs.

Liquid path starts between Lens and Bezel and moves out over gasket, out over spacer, out over nut, out over flex cover and away from button. Flex cover 68750100. Protects flex cable from liquid spills.

Button Cleaning Instruction:

Step One: Access power switch, taking care not to pour liquids further into the machine. Dry excess spills from the tray before rotating the main door completely up. Turn off power either through top door access hole, or lower main door.

Off switch is located below panel through access hole

Step Two: Cover Player Tracking. As long as the plastic cover is installed on the universal slant you can spray a liberal amount of cleaning solution over the sticky buttons. Soda Water can be used to break down sugars from drinks or a mild soap and water solution. Ensure that the cleaning solution does not contain Alcohol, Ammonia, or Silicones.

Step Three: Actuate the button several times by pressing on the cap to work the cleanser in between the Lens and Bezel.

Step Four: Force air through the Lens and Bezel to remove cleanser and sticky residue. The DATAVAC, canned, or compressed air all work well to force air through the buttons.

Step Five: Dry up any cleanser on switch panel. Dry the tray before rotating the main door completely up.
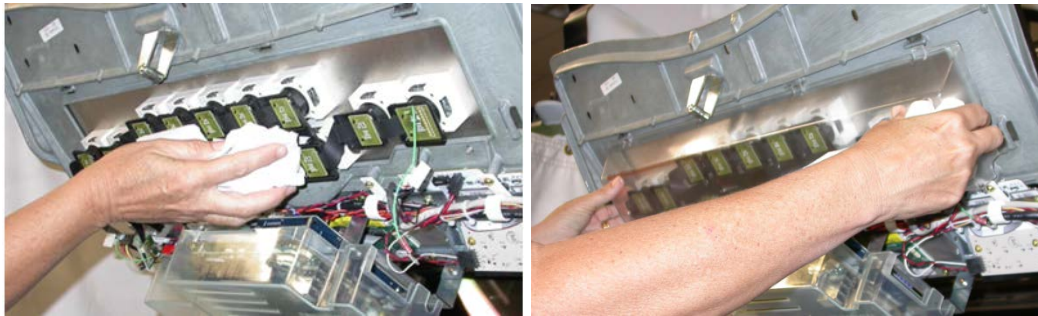

Note: Never repeat this process more than twice. If buttons continue to stick after two cleanings the complete button assembly will need to be removed from the game, disassembled and cleaned.

Remove and dry the tray.

Pat the flex dry with a dry towel or equivalent and return the liquid spill tray.

Step Six: Turn power back on, close and lock machine.

The button contamination can be seen through the clear body. After cleaning, the body should not show any drink residue. If so, proceed to **External Button Cleaning Procedures** on page 20.

External Button Cleaning Procedures:

➢ For more aggressive cleaning you will need to remove the dynamic button from the game and disassemble it. The steps provided in this section to disassemble and reassemble a dynamic button do not only apply to aggressive cleaning of the button, but also in situations of a malfunctioning button that needs repairing. A sticky button could also be a sign of a weak spring.

➢ The process to disassemble a Non Edge Lit Dynamic Button is the same as the Edge Lit Dynamic Button.

➢ It is important to note that once you take the first step of removing the lens holder from the bezel, the complete unit must be broken down so that you can align the parts in the correct order for reassembly. **Failure to do so may result in damage to the internal components of the switch.**

➢ **Cleaning the Dynamic Button:**

1. Be sure you are properly grounded using IGT recommended ESD ground strap.

2. Power down the game.

3. Disconnect the flex cable connector before removing the Dynamic Button from the panel. To do this you must pinch together the two legs on the Conan board then pull the flex cable connector out of the Conan board. See Figure 1 below.
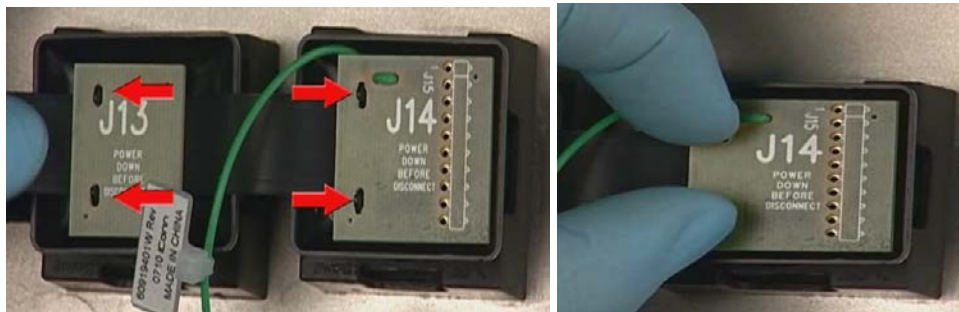

Figure 1

4. Inspect the Flex cable connector for any signs of contaminants.

5. To clean Flex board spray liquid cleaner onto the technical cleaning brush, then use the brush to clean the board. Use the canned air to dry off any excess liquids. Do not use a dry cloth.

6. Next, remove the complete Dynamic Button assembly from the game.

7. Before disassembling the button you should inspect the bottom of the Conan board first. If there are signs of contaminants, use the cleaning brush, liquid cleaner and canned air to clean it.

8. To clean the Conan board spray liquid cleaner onto the cleaning brush and then use the brush to clean the board. Use the canned air to dry off any excess liquids, try to keep from blowing any excess liquids back into the lens cap. Do not use a dry cloth.

9. With the button assembly removed from the game you can now liberally spay liquid cleaner directly between the lens holder and bezel while working the switch. Use canned air to blow out any excess liquids.

10. If no additional cleaning is necessary you can re-install the button and test it. Be sure to check for any moisture in the lens cap before installing. If the moisture is not taken care of a foggy button could occur later on after it is re-installed.

11. If button continues to be sticky: The button will have to be disassembled, inspected and possibly cleaned, or it might have a weak coil spring.

➢ **Tips for Disassembling and Cleaning the Dynamic Button:**

1. First the rubber seal or gasket should be carefully removed.

2. Next you will need to take a small pocket flat screwdriver and on the bezel, push down on the four table legs of your OLED assembly. This will unlock the assembly.

3. Next you need to separate the lens cap/lens holder portion of the button assembly into two separate parts using a small pocket flat screwdriver. Using light pressure take your flat screwdriver and push down on the retaining clips in the side of the bezel assembly. Be careful not to apply too much pressure to the retaining clips, this could cause them to break. If more pressure is needed, press on the visible area of the Lens Cap to force it out of the Bezel/Switch body. See Figure 2.
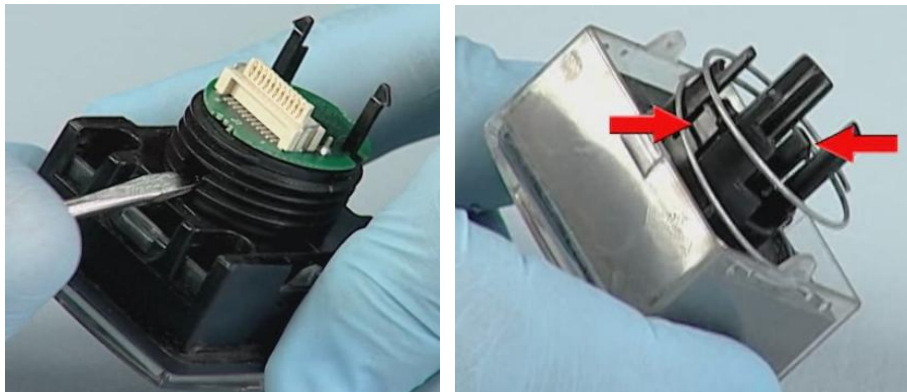

Figure 2

4. Remove and inspect the coil spring. If coil spring appears bad replace it with a new one after you have finished with cleaning the button assembly.

5. Next spray your liquid cleaner onto a cleaning brush then clean all sides of your lens cap. Wipe off cleaner with soft dry cloth.

6. Next using the same brush and cleaner, clean inside of the bezel assembly. Clean all sides of the bezel assembly making sure you remove any liquid or dried sticky residue. Use a soft dry cloth to wipe away any remaining residue, followed by canned air to dry out the assembly.

7. Next, you must now finish disassembling the button before you can start the reassembly process.

8. The lens caps have two positive locking latches that lock the lens to the lens holder. **See Figure 3.** Two small pocket flat screwdrivers must be used to disengage the locks. Then a pair of pliers is needed to remove the Lens Holder from the Lens Cap. **See Figure 4.**
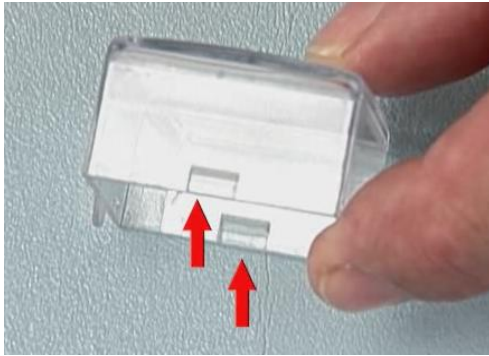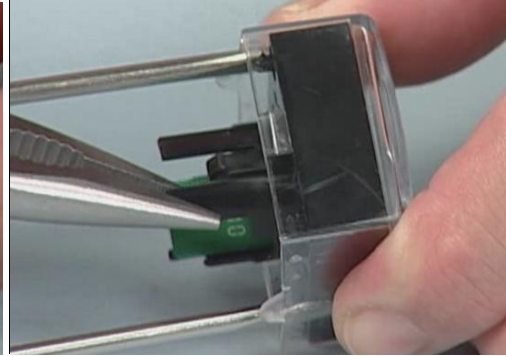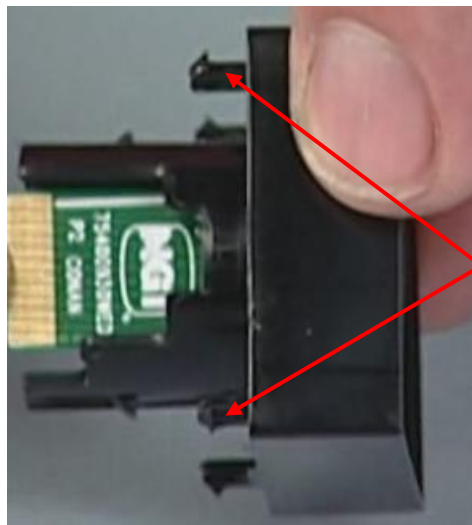

| **Figure 3** | **Figure 4** |

9. When pulling the lens holder away from the lens cap watch to make sure that the OLED table doesn't fall out of the lens holder and drop to the floor. If the OLED is still intact simply push on the four table legs to separate the OLED table from the lens holder. See Figure 5.

Push on the 4 table legs to remove OLED assembly from the Lens Holder

Figure 5

10. Next you will need to remove the micro switch and Conan board out of the bezel assembly. Looking at the example in **Figure 6** you will see that the bezel assembly has two lips on either side of the assembly. You can also see there are two locking legs on the Conan Board Micro Switch assembly.
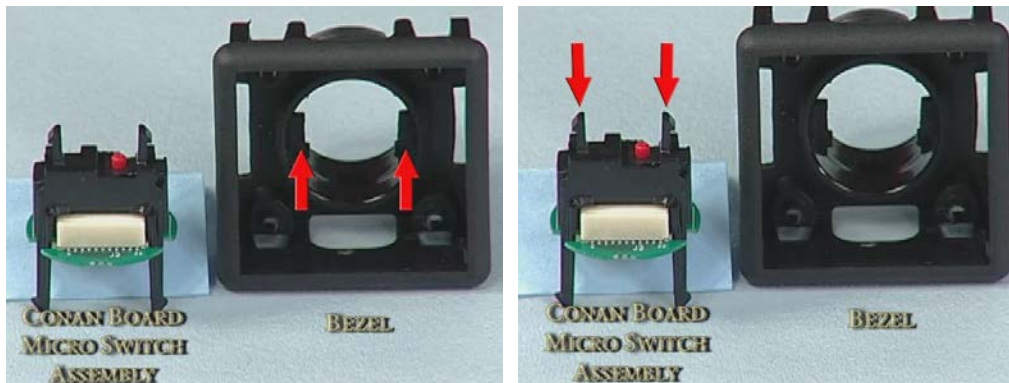

Figure 6

12. To release the Conan Board Micro Switch assembly from the bezel. Using the magnet end from a pocket screwdriver push down and inward on each side of the two locking legs shown in Figure 6, then pull the assembly out from the bezel. See Figure 7.

Figure 7

13. You have now successfully disassembled the complete Dynamic Button Assembly. Take this time to inspect and replace any worn out or defective parts. Also be sure everything is properly cleaned and that there is no left over residue on the button assembly.

➢ **Tips for Reassembling the Dynamic Button:**

1. The first step in the reassemble process is the bezel, lens holder and the spring. Be sure to line everything up the way it is shown below.

2. Look into the center of the bezel and locate the word "Top" and orient to the top of the Bezel. See Figure 8.
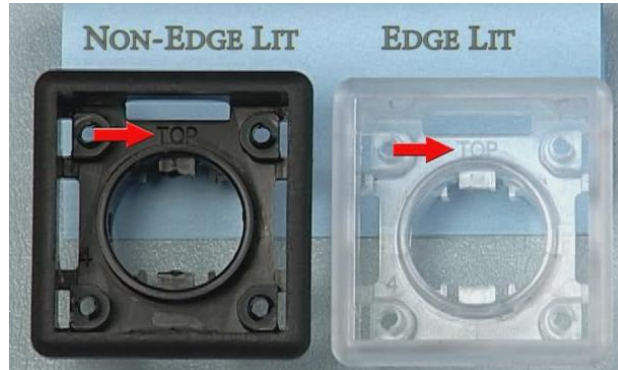

Figure 8

3. Now take the lens holder and look at the center. You can see the micro switch actuator arm. This arm is what activates the micro switch when the button is pushed. Make sure the open end is on the left with the arm attached to the right side. See Figure 9.
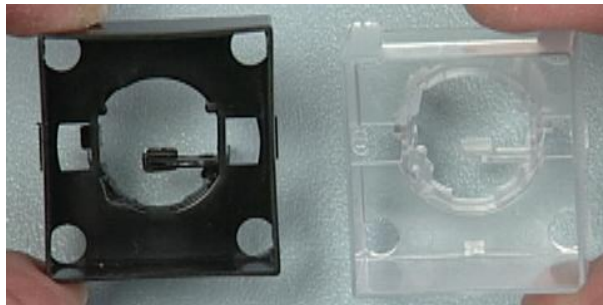

Figure 9

4. Now you have everything lined up place the coil spring in the bottom of the bezel. There is a small lip that keeps the spring in place while you insert the lens holder into the bezel. See Figure 10.

Figure 10

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5. Insert the lens holder into the bezel until you hear the locking legs click. Then press the lens holder into place within the bezel. Press on the lens holder to make sure the spring is pushing it all the way up. See Figure 11.
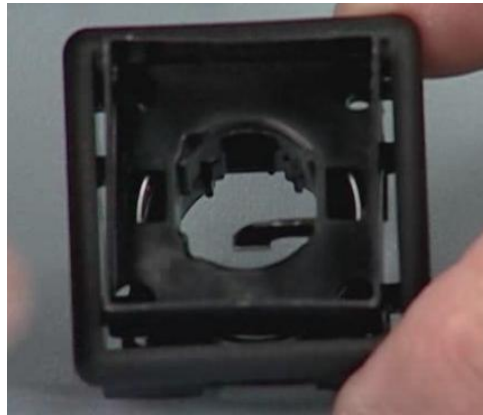

Figure 11

6. You are now ready to connect the OLED controller with the interconnect board. Take the interconnect board and insert the end marked P3 Lattice into the OLED controller. See Figure 12.

Figure 12

7. With the lens holder now installed into the bezel you can no longer see the word "Top" within the bezel. Before installing the OLED controller into the bezel assembly, be sure that the bezel orientation is aligned the same as shown in Figure 11. With the actuating arm to the right.

8. Looking at the top of the OLED display shows three out of four sides that are the same thickness while the bottom edge is noticeably thicker. The thicker side will need to be installed at the bottom of the bezel assembly. See Figure13.
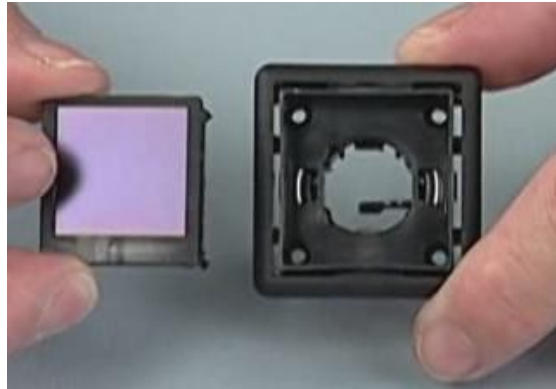

Figure 13

9. Place the OLED assembly into the bezel and press down on the outer edges of the OLED assembly until you hear the legs click into place. **Do not press directly into the center of the OLED display, this could damage it and would leave finger prints causing the image to appear out of focus.** Once installed the OLED is recessed within the lens holder and remains stationary. When you push on the top of the button it is the lens holder that you will notice moving within the bezel.

10. The next step is to install the Conan Board Micro Switch Assembly into the bezel. It is important to note that the Conan board and micro switch are one complete component. So if this component were ever to fail you would need to remove the locking clips and install it onto the replacement Conan Board Micro Switch Assembly. See Figure 14.
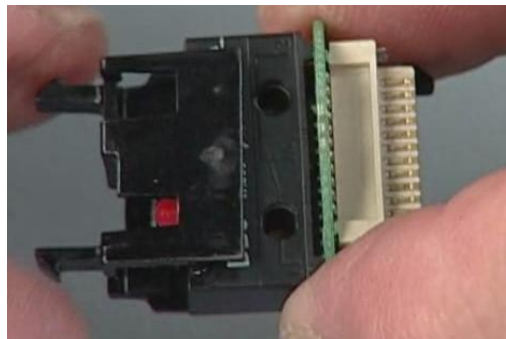

Figure 14

When installing the Conan board you will notice the inner connect board at the bottom of the bezel assembly. You will need to connect J2 of the Conan board into P2 of the interconnect board. See Figure 15.
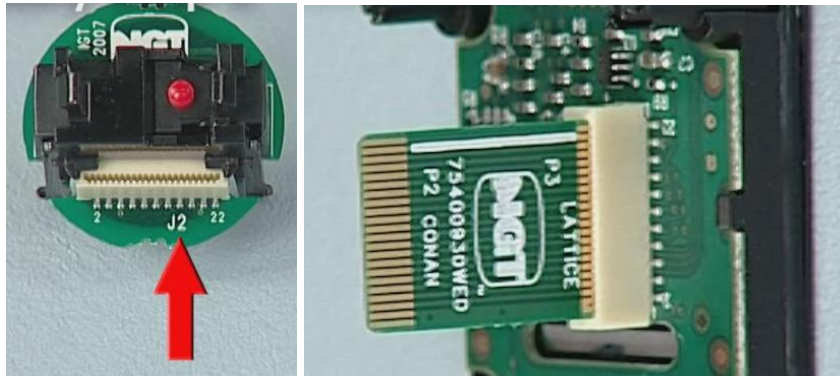

Figure15

Looking at the bottom of the bezel line up P2 of the interconnect board with J2 of the Conan board. This will also line up the actuating arm and the micro switch. Slide in the micro switch assembly carefully aligning the interconnect and Conan boards. This will be somewhat of a blind connection. Press the two together until you hear the locking clips of the micro switch assembly click and lock into the bezel. See Figure 16.
Note: At this point you should press down on the lens holder and listen to confirm that the switch is working.

Figure 16

11. The next piece is the lens cap. Hold the button assembly with the top side up while looking at the OLED display. On two sides of the lens cap you can see two tabs. These tabs are the top and bottom of the lens cap and will need to be installed in the top and bottom location of the switch covering the OLED and lens holder. See Figure 17.
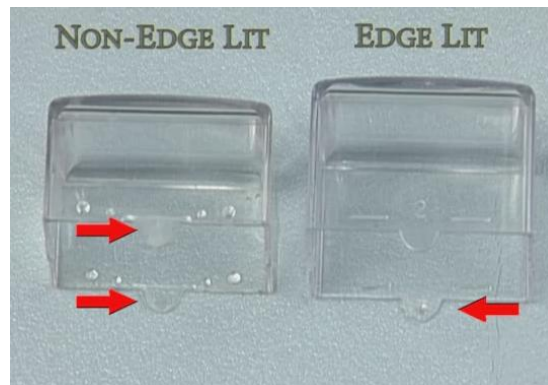

Figure 17

Position the lens cap into place then press it down into the switch assembly until you hear it click. It should work freely and you should be able to hear the micro switch working. See Figure 18.
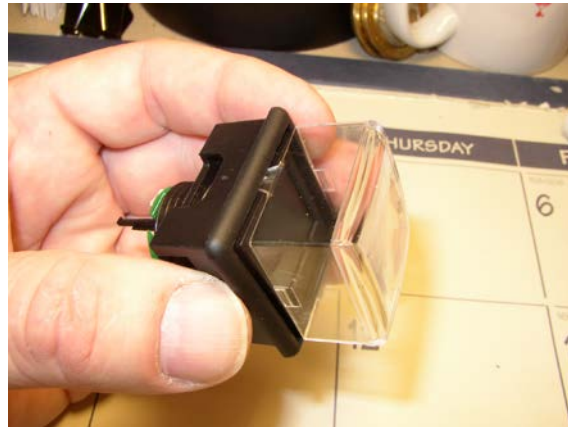

Figure 18

12. The final piece before installing the button assembly back into the game is to re-install the rubber seal or gasket.

13. Install button assembly back into game, apply power to the game and test switch functions. If button no longer appears sticky, it is still recommended to fully test functionality before moving on.